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# Do the macroeconomic variables have any impact on the Islamic bank deposits? An application of ARDL approach to the Malaysian market

Mohammad Ashraful Mobin<sup>1</sup> and Mansur Masih<sup>2</sup>

## Abstract

*This paper makes an attempt to investigate the impact of selected macroeconomic variables on the level of deposits in the Islamic banking system. Malaysia is used as a case study. We apply 'Auto – Regressive Distributive Lag' model which has taken care of a major limitation of the conventional cointegrating tests in that they suffer from pre-test biases. Based on above rigorous methodology, we try to measure both long- and short-run relationships among these variables. By applying ARDL techniques, we find that the determinants such as Inflation has strong impact on deposits of Islamic banking system while other macroeconomic variables GDP and Kuala Lumpur composite Index do not have significant impact. Most of the theories related to savings behaviour are not applicable to Islamic banking customers. Therefore, there is a possibility that religious belief might play an important role in the banking decisions of Muslim customers. The most relevant finding from the policy perspective is the significant negative effect of inflation on the Islamic banks' saving deposits. Controlling inflation and thereby providing macroeconomic stability is essential for promoting Islamic banking.*

Key words: Malaysia, Banking, Islam, Depositors' behaviour, ARDL cointegration

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## **Do the macroeconomic variables have any impact on the Islamic bank deposits? An application of ARDL approach to the Malaysian market**

### Introduction: The Issue Motivating the Study

Islamic banking has emerged as an alternative to interest-based conventional banking in a growing number of countries. It has grown significantly since its beginning in 1970s and has moved beyond the confines of niche market, largely due to greater financial liberalization, an unprecedented inflow of petrodollars to the Middle East and the increasing demand to apply Islamic rules in financial transactions (Imam and Kpodar, 2010; Cevik and Charap, 2011). However, from its assets side Islamic banks mostly offer debt-like instruments, while on its liability side Islamic banking deposits are fundamentally structured in different ways than the conventional banking deposits. Using the approved Shariah contracts such as Qard, Wadiah, Murabahah and Mudarabah Islamic banking deposit gets its distinct character contrary to the conventional concept which is based on “lender-borrower” relationship. Moreover, the Shariah-approved contracts are unique as they feature a different nature of risk and return (Syahmi, 2010). This is especially the case of Mudarabah contracts which constitute most of the total deposits in Islamic banks.

Like conventional banks, Islamic banks also depend on depositors’ money as a major source of funds. Bank Islam Malaysia Berhad (one of the Islamic banks in Malaysia) for example, had total deposits amounting to 83% of total liabilities and shareholders’ equity as at the end of December 1998. Since depositors’ money is a major source of funds, it is important for the management of Islamic banks to know the factors that influence customers’ decision making in depositing their money with Islamic banks.

Since the role of commercial banks as the most important financial intermediary will persist, studies in savings management will continue to become a topic of interest for many researchers. Of all the topics widely discussed in the savings literature, we find that studies on saving determinants emerged at the top of the list. These studies, however, focused mainly on economic variables and none have included religious dimension as one of the saving determinants.

The vast empirical literature on savings behaviour has listed a number of variables which determine the level of private saving. Based on the discussion and elaboration presented in literature review and theoretical underpinning, the explanatory variables selected for this study are the Total deposit in Islamic banks (TDP) Kuala Lumpur composite index (KLCI), Inflation rate (INF) and GDP. Though it is hard to believe that Muslim customers are not influenced by any macroeconomic variables, we seek to investigate whether these variables do have any significant impact on Islamic banks savings deposit.

Inflation may influence savings through several channels. First, theory postulates that greater uncertainty should raise savings since risk-averse consumers set resources aside as a precaution against possible adverse changes in income and other factor. Hence, inflation may increase precautionary savings by individuals. Second, inflation can influence saving through its impact on real wealth. If consumers attempt to maintain target level of wealth or liquid assets relative to income, saving will rise with inflation. Finally, savings may rise in inflationary period if consumers mistake an increase in the general price level for an increase in some relative prices and refrain from buying (Deaton, 1991). But In contrast, previous study finds inverse relationship between Islamic bank savings deposit and Inflation. In this paper, therefore, we examine how inflation affects the savings rate through ARDL approach.

The growth in the economy is represented by GDP. Most empirical literature has shown an ambiguous relationship between savings and growth. Similarly, the direction of causality between these variables is still under much debate. The simple permanent-income theory postulates that higher growth reduces current savings because of higher anticipated future income. Thus, urging people to dis-save against future earnings. But in the life-cycle model, growth has an ambiguous effect on savings, depending on which age cohorts benefit the most from the growth, how steep their earning profiles are, and the extent to which borrowing constraints apply.

Kuala Lumpur composite Index ( KLCI) represents the future growth in the economy and the confidence level of people towards the economy of the country. If people are optimistic about the economic growth, instead of putting their money in the bank accounts, they will buy stocks hoping that they will benefit from higher dividend rates and capital gains. Therefore, it is expected that this variable will have an inverse relationship with deposits.

The objective of this study is to examine the effect of selected economic variables on deposits placed at the Islamic banks in Malaysia. Both long- and short-run relationships between these

variables are measured by using ARDL approach. To the best of our knowledge, this is the first attempt to empirically examine the depositor's behaviour in the Islamic banking environment through ARDL approach.

### Overview of Islamic Banking in Malaysia

Islamic banking in Malaysia Islamic banking was implemented in Malaysia following the enactment of the Islamic Banking Act in April 1983 and the subsequent establishment of its first Islamic bank, Bank Islam Malaysia Berhad (BIMB), in July 1983.<sup>11</sup> The Islamic Banking Act of 1983 provides Bank Negara Malaysia (BNM), the central bank of Malaysia, with powers to regulate and supervise Islamic banks. To disseminate Islamic banking nationwide, BNM introduced the Interest-free Banking Scheme in March 1993, which allows existing banking institutions to offer Islamic banking services using their existing infrastructure and branch network. Today, Malaysia is widely believed to have the most developed Islamic financial system in the world that operates side-by-side with a conventional-banking system. Besides the Interest-free Banking Scheme, Malaysia has a well-developed Islamic interbank money market, Islamic government debt securities market, and Islamic insurance market. The Islamic interbank money market, introduced in January 1994, allows Islamic banking institutions to trade in designated Islamic financial instruments among themselves.

Islamic banks, in general, are restricted from participating in the conventional-banking system, while the other financial institutions can participate in both the conventional-banking system and Islamic banking system. Commercial banks, finance companies, merchant banks, and discount houses' participation in Islamic banking is through the Interest-free Banking Scheme. Thus, we find that for Islamic banks, all their assets are managed under the Islamic banking system. For the other financial institutions, the percentage of their assets that are under the management of the Islamic banking system is relatively small in comparison. Islamic banking assets only accounts for 7.3%, 11.4%, 6.0%, and 18.6%, respectively, of commercial banks, finance companies, merchant banks, and discount houses' total portfolio of assets. Among the commercial banks, we find that Islamic banking assets accounts for a larger share (8.5%) of the domestic banks' asset portfolio than that of foreign banks (3.7%).

## Theoretical Underpinnings

Clear understanding of the theoretical background of the issue would be adding value to the strength and usefulness of the study.

Commercial banks, both conventional and Islamic, are dependent on depositor's money as a source of funds. According to the Keynesian theory of demand for money, there are three main motives why people hold money: transactions, precautionary and investment. In order to cater for these motives, commercial banks offer three categories of deposit facilities that are demand, savings and time deposits. Hence, the purpose of deposit facility is for convenience or for making daily commitments. The second category of deposit is the savings account, which caters the need of those who wishes to save money but at the same time want to earn an income. Depositors of savings account hold money because of precautionary motives while are simultaneously induced by their investment motives. Precautionary motives for holding money refer to the desire of people to hold cash balances for unforeseen contingencies.

From the depositor's perspective there are three main theories related to savings behaviour: the permanent-income hypothesis (Friedman, 1957); the traditional models of the life-cycle hypothesis and the more recent buffer-stock theory of savings behaviour (Deaton, 1991; Carroll, 1992).

Permanent Income Hypothesis was introduced by Friedman (1957) predicting that expectations of higher future income reduces current saving. This hypothesis introduces two components of income namely permanent income and transitory income, each of which undoubtedly has an effect on savings. Permanent income is described as expectation of the long time income over a planning period while transitory income is the difference between actual and permanent income. In the event of a windfall of today's income, the hypothesis predicts that a higher savings will follow in order to sustain tomorrow's higher spending as well as guard against a decline of tomorrow's income. Transitory income changes are met by consumption smoothing whereas permanent income changes does not justify an increase on current saving since more can be consumed now and in the future.

In the Life Cycle Hypothesis from Ando and Modigliani (1963), consumption in a particular period is believed to depend on the expectations about lifetime income. This implies that

savings is done to ensure smooth consumption throughout time. As there is a tendency for income to fluctuate systematically during one's life; a person will become a net saver during their working years then later dis-savers in their retirement years. This consequently determines person's saving behaviour. The macroeconomic implications of the LCH set it apart from the prevailing Keynesian theory at the time, which assumed that the saving income ratio was determined by level of income. It also implies that the aggregate private saving rate will also be influenced by income growth. Modigliani (1966, 1970) argues that a higher growth rate increases the total income of the working population relative to that of retired and dependent persons, thus raising the aggregate saving rate. The direction of causation from income growth to savings is strongly supported by Attanasio et al. (2000).

Another theory of savings brought forth by Deaton, 1991; Carroll, 1992 known as the buffer-stock theory, posits the belief that the main reason consumers hold assets is to protect their consumption against any uncertainty or fluctuations in future income. The buffer stock behaviour states that consumers are both impatience and prudence when faced with important income uncertainty. The theory describes impatience by stating that should incomes become certain, consumers would borrow against future income to finance current consumption and prudence would be due to their motives to safeguard and take precautionary measure. Carroll (1992) showed that these circumstances logically imply the existence of a target wealth stock. A wealth stock is determined by the consumers in such a way that whenever their wealth falls below the believed target, fear or prudence will dominate the impatience quality resulting in an effort to save. However, should wealth be above the chosen target, prudence is out ruled by impatience and consumers will most likely start to dis-save.

Participation in religious services may also alter an individual's savings preferences and opportunity sets. Participants, who attend religious activities frequently, internalize religious rules related to economic behaviour much stronger than religious individuals who are less strong involved, since "religious human capital" (Iannaccone, 1998), that is, "the religious knowledge and familiarity with church ritual and doctrine, and friendships with fellow worshipers" (Iannaccone, 1998, p. 1481) is simultaneously formed and increased by religious service participation. In effect, the religious belief of those who attending more often is strengthened, since they get higher returns on their investments of time and money in their "religious human capital" (Iannaccone, 1998). Moreover, the literature on social capital stresses the role of organizational membership for the building of individual social capital.

Attending religious activities regularly creates a social network (Guiso et al., 2003, 2006), which may be used to gather information required to make appropriate savings decisions or to adapt investment strategies from fellow attendees.

Jalaluddin (1992) argues that, in contrast to the Keynes' absolute income hypothesis, saving is not merely a 'residual' concept, in the sense that what is left over from consumption is treated as saving where no ethical values and social responsibilities are attached. A Muslim saves to perform his duties to himself, family, society, and Almighty Allah, which definitely require economic backing. Thus, there is a social welfare dimension to the savings behaviour of a Muslim. In fact, as savings are invested, economically rewarding opportunities will increase which is expected to increase the welfare of Muslim ummah. Furthermore, he argued that the life-cycle hypothesis proposed by Modigliani and Brumberg (1954) can work in the framework of Muslim's saving behaviour. The four motives of saving proposed in the life-cycle model are consistent with Islamic norm behaviours. These motives are evident not only contemporarily, but also during the prophet's (pbuh) time. A Qur'anic verse, for example, states that a Muslim should "...not spend everything so that you became blameworthy and destitute" (al-Qur'an 17:29), hence emphasizes the importance of savings.

Religious principles are the foundation of Islamic banks where there are other factors dominant the economic behaviour of Muslims. Principles as belief in the Day of Judgment and the Muslim earning must be in line with Shariah are expected to influence the perception of Muslim depositors' perceptions of Islamic banks, then the Islamic bank customers are not expected to be guided by the profit. Instead, when they deposit in Islamic bank rather than conventional bank, it is the right way to invest the resources given by Allah. (Naqvi, 1981; Haron and Ahmad, 2000).

The status of the relationship between Islamic banks and their suppliers of funds is dependent on the principles of Shariah used in creating that relationship. Theoretically, this relationship is bounded by three general principles which dominate the economic behaviour of Muslims, namely, belief in the Day of Judgment and life in the hereafter, Islamic concept of riches and Islamic concept of success (Khaf and Ahmad, 1980). All these principles are expected not only to have a significant impact on the decision-making process of Muslims, but also to have an influence on their perceptions towards Islamic banks. The first principle mentioned above has an impact on the suppliers' (depositor's) behaviour and their decision making process. The choice of action is not only based on the immediate returns but also in the hereafter.



Therefore, the decision to have a banking relationship with Islamic banks is not because of profit motive but rather to gain the blessings of Allah. Therefore, Variables are expected not to have similar impact on both conventional and Islamic banks.

Based on the above theoretical standpoints, this study attempt to provide theoretical answers to the research questions of our study and would like to progress our study with empirical analysis in order to provide empirical answers to the same research questions. This theoretical and empirical combination is significant since practical situations may deviate from the theoretical relations depending on timing and conditions of the economies.

### Literature Review

The importance of savings has long been recognized in the history of mankind from both religious and economic perspectives. To date, there is abundance of literature related to savings. This literature can be loosely clustered into several categories such as measuring private savings behaviour of a particular country, the determinants of savings, the effect of monetary and fiscal policies on savings and the relationship between savings and institutional profitability and public policy. Since the role of commercial banks as the most important financial intermediary will persevere, studies in savings management will continue to become a topic of interest for many researchers. It is indeed very important to understand the determining factor in influencing saving among the customers so as to appreciate the reasons or motivations of the customers patronizing the Islamic banks. The objective of this study is to examine the effect of selected economic variables on deposits placed at the conventional and Islamic banks in South East Asian countries.

Despite an extensive literature on savings behaviour, there are not many studies, which specially focused on the factors that determine the level of deposits at the commercial banks. In the past, efforts were made by researchers to determine private saving behaviour not only for a particular country but also for cross-country comparisons.

Various studies have analyzed the possible determinants of private saving rates mainly for individual countries. These studies have estimated the effects of economic and demographic variables on private saving. These studies attempt to isolate the key determinants of the private saving rate across a large number of industrialized and developing economies. However, the econometric findings of the studies have not offered clear evidence regarding

the determinants of private saving behaviour, which creates an obvious deficiency that may affect applied research and policy making.

Lambert and Hoselitz (1963) were among the first researchers to compile the works of others on savings behaviour. They edited the works of researchers who studied the savings behaviour of households in Ceylon (now Sri Lanka), Hong Kong, Malaya (now Malaysia), Pakistan, India, Philippines and Vietnam. Snyder (1974) did a similar study but reviewed the econometric models employed by others. Since then, studies on savings have continued to become an area of interest by researchers.

Some of the recent works on savings behaviour of a particular country are those by Ostry & Levy, 1995, for France; Ca´rdenas & Escobar, 1998; Corbo & Schmidt-Hebbel, 1991, for Colombia; Morande´, 1998, for Chile; Lo´pez Murphy & Navajas, 1998, for Argentina; Loayza & Shankar, for 2000; Athukorala & Sen ,2003 for Taiwan; Ozcan et al. ,2003 for Turkey, Qin, 2003 for China and Hondroyiannis ,2004 for Greece.

Qin (2003) examined the savings behaviour of Mainland Chinese and test the factors such as Percapita expenditure, Interest rate, Money supply, Inflation, population, total deposit, per capita deposit, govt. wages, income disparity. Their result founds that expected savings potential was the chief determinant of bank deposits. Similarly, just like their Taiwanese counterparts, interest rate seems to be important to Mainland Chinese in making deposits. High bank absorption of household savings is an important fact for the rapid growth in quasi-money, which in turn explains the exceptionally high M2/GDP ratio.

I found two studies that take India as a sample to determine the savings. Loayza and Shankar (2000) used co-integration approach to determine the relationship among savings and other factors like real interest rate, per capita income, the dependency ratio, financial development, the government saving rate and the share of agriculture in gross domestic product (GDP). Their results revealed that real interest rate, per capita income and the share of agriculture in GDP had a positive relationship with savings, whereas inverse relationship were found for financial development, inflation and the dependency ratio. Another by Athukorala and Sen (2003) ascertained factors such as rate of growth, real interest rate on bank deposits, spread of banking facilities and inflation had significant positive relationship with savings but inverse relationship with changes in the external trade. Loayza and Shankar (2000) found positive relationship between inflation and saving but Athukorala and Sen (2003) find the inverse relationship.

Other studies in different countries consider few other demographic and economic variables to determine the savings behaviour. Standard life-cycle framework is used by Athukorala and Tsai (2003) to estimate the impact of population dynamics, growth of disposable income, social security contribution, and credit availability and financial reforms on savings in Taiwan. This result shows that Income growth, aging of the population; changes in social security contributions and the availability of credit were significant to savings performance. While interest rate had a significant positive impact, inflation seems to move in an opposite direction. Precautionary was also one of the important factors that motivated them to save. One study in Turkey by Ozcan et al. (2003) found that with the exception of government savings; income level, financial depth and measures, as well as inflation all had a positive impact on savings. Another study, Hondroyiannis (2004) applied co-integration techniques to determine the savings behaviour of Greece households and found that fertility changes, old dependency ratio, real interest rate, liquidity and public finance has significant effect on saving function. All these studies prove that economic variables like interest rate, inflation rate; GDP has significant impact on savings behaviour either positively or negatively.

There is also a number of empirical literatures that makes cross-country comparison. The works of Doshi (1994), Masson et al. (1998), Loayza et al. (2000), Agrawal (2001), Sarantis and Stewart (2001), Cohn and Kolluri (2003) are worth reviewing. Based on the life-cycle framework, Doshi (1994) examined the effect of population growth (measured by the age structure and life expectancy period) and productivity growth measured by the gross national product level and GDP (growth) on savings in 129 countries. This study found that life expectancy had a positive effect on savings in less-developed countries, whereas an inverse relationship was recorded for the high-income countries. While demographic variables have an important effect on the savings ratio in Asia, per capita income in Africa and income growth in Latin America was found to be important. The determinants of private savings behaviour of industrial and developing countries was studied by Masson et al. (1998) and they found that factors such as GDP growth, real interest rate and changes in the term of trades were found to be positively related to savings in both countries, though there was a slight different in term of the magnitude of these relationships.

Loayza et al. (2000) investigated the effects of policy and non-policy variables on savings and their study reveals that significant positive relationship of saving rates with the level and growth rate of real per capita income and the influence of income is larger in developing than in developed countries. It also found the significant impact of inflation on savings.

The relationship between saving and growth in seven Asian countries (South Korea, Taiwan, Singapore, Malaysia, Thailand, Indonesia and India) was investigated by Agrawal (2001). The author reported that both high rate of growth of income per capita, and the rapidly declining age dependency ratio contributed to the high rate of saving in these countries. As for the interest rate, a significant positive relationship was found for Malaysia and Thailand and negative for Indonesia. Sarantis and Stewart (2001) investigated the saving behaviour in the Organisation for Economic Co-operation and Development (OECD) countries and presented some interesting findings. Demographic factors and credit constraints were significant and had the anticipated sign in the overwhelming majority of OECD countries. Greater financial liberalisation and integration minimized the liquidity constraints, thus leading to lower savings. One of the interesting findings forwarded by the authors is that government deficit does not increase savings and this is in contrast with the Ricardian Equivalence.

Mixed empirical evidence was found, since there might be various paths through which culture and especially religions may act on the macroeconomic level. Looking at the aggregate saving ratio, Horioka (2007), for instance, doubted that culture is an important explanation of Japan's high saving rate in the past. He showed that the high saving rate might be traced to several economic, demographical and institutional factors, like the income growth rate, the age, and the household's wealth holdings. Although he gives a comprising descriptive explanation of Japan's high saving rate, a further testing of cultural and religious impacts is missing.

Although some studies found an impact of religious beliefs and belonging on the aggregate saving ratio and one contribution states a positive relationship between religious activities and thriftiness (Guiso et al. 2003, 2006), studies using micro data are scarce. Until now few authors have examined the individual saving ratio with respect to cultural conditions (Carroll et al., 1994, 1999; Renneboog and Spaenjers, 2012). Comparing the saving behaviour of immigrants to Canada from different cultural backgrounds using data from the Canadian Survey of Family Expenditures for 1982 and 1986, the former did not find any evidence for cultural factors affecting the saving patterns. In contrast to these findings are their results when replicated their paper from 1994 for the United States in 1999. Using household data from the 1980 and the 1990 Censuses of Population and Housing in the United States, they showed that immigrants in the US from different countries of origin exhibit different saving patterns. However, their results do not support the hypothesis that cultural conditions of the

country of origin impacts individual savings behaviour, 'since the saving patterns of immigrants do not resemble the national saving patterns of their countries of origin' (Carroll et al., 1999, pp. 49). Renneboog and Spaenjers (2012) analyzed whether and how religious denominations influence the financial decisions of Dutch households. Using data from the DNB Household Survey for the years 1995 to 2008, they showed that religious households report more frequently that they have saved in the previous year. Thereby the effect is similar in magnitude for Catholic and Protestant households, who are about 3% more likely to save than non-religious households. Besides the studies of Carroll et al. (1994, 1999) and Renneboog and Spaenjers (2012) the author is not aware of contributions which examine the impact of cultural factors on the individual decision to save. The question of whether religiosity has any relevant impact on a household's savings decisions therefore merits further examination.

There are few studies especially in the bank patronage literature that incorporates religious dimension in examining the factors that influenced the public when deciding in which bank to deposit their money. For example, Haron et al. (1994), Metawa and Almossawi (1998) and Naser et al. (1999) studied the influence of Islamic teaching on the reasons of why customers patronize Islamic banks. While customers in Bahrain perceived religion as the most important element in selecting their banks, customers in Jordan, Malaysia and Singapore believed both profit and religion were equally important in their decision-making.

These studies somehow confirm earlier work, which found that both religious and economic factors are equally important for customers in patronizing Islamic banks (yusof, et al., 2008; Kassim, et al,2009; Rahmatina, et al,2009; Ahmad and Haron, 2002; Gerrard and Cunningham, 1997; Kader, 1993, 1995; Haron et al., 1994; ).

Yusof, Wosabi and Abdul Majid (2008) test the sensitive of Islamic banks' deposits to monetary policy changes in Malaysia and Bahrain using auto-regressive distributed lag (ARDL) model, Compared to the Malaysia Islamic banks' deposits, the study finds that the Islamic banks' deposits in Bahrain are sensitive to monetary policy changes, This implies that the Bahrain Islamic banks are less capable to offset the de-stabilizing impact of monetary policy as compared to its Malaysian counterpart. Using impulse response functions and Variance decomposition techniques on data from conventional and Islamic banks in Malaysia, Kassim, Abd Majid and Yusef (2009) finds that Islamic banks' balance sheet items are relatively more sensitive to monetary policy changes, while the conventional banks'

balance sheet items, particularly the conventional loans are insensitive to interest rate changes.

(Rahmatina, et al, 2009) attempts to determine the factors affecting saving in the Islamic banks in Indonesia. They applied Vector Autoregressive and Impulse response function technique on different variables covering the data from March 2000 to August 2007. The results highlight the influential role of conventional interest rate in determining the level of saving in the Islamic banks. The study finds the existence of displaced commercial risk between the Islamic and conventional banks, such that the Islamic banks' depositors transfer their funds to the conventional banks when the rate of return provided by the Islamic banks is significantly lower than the interest rate of its counterpart.

Haron et al, 2008 did an empirical research applying advanced time series technique to determine the determinants of both conventional and Islamic banks in Malaysia. Their result shows determinants such as rates of profit of Islamic bank, rates of interest on deposits of conventional bank, base lending rate, Kuala Lumpur composite index, consumer price index, money supply and gross domestic product have different impact on deposits at both Islamic and conventional banking systems. In most cases, customers of conventional system behave in conformity with the savings behaviour theories. In contrast, most of these theories are not applicable to Islamic banking customers. Therefore, there is a possibility that religious belief plays an important role in the banking decisions of Muslim customers.

In addition to these empirical studies, several studies have been conducted to investigate the factors that determine the behaviour of Islamic banks' depositors by using qualitative methods and surveys. In contrary to the general findings of the empirical studies, most of the studies found that profit motive did not appear to be a major driver of the behaviour of Islamic banking customer. Instead, religion is suggested as main reason for choosing Islamic bank, together with Islamic banks specific factor such as cost and benefit of products/services offered (products prices and rate of return of the investment), service quality (fast/efficient service and friendliness of the bank's staff), size and reputation of the bank, convenience (location and ample parking space) and friends/families influences (Metawa and Almosawi, 1998; Almosawi, 2001; Naser et al., 1999; Bank Indonesia, 2000-2005). A recent study by Dusuki and Abdullah (2007) adds that corporate social responsibility activities are seen as important determinant in dealing with Islamic bank in Malaysia.

In contrary, survey based study by Sudin Haron (1994) shows a different result from other surveys that both Muslims and non-Muslims who patronized commercial banks have a common perception in selecting their banks. Cengiz Erol, Radi El-Bdour (1989) also found the same result that there's not any significant impact of religious motives on depositors' behaviour towards Islamic Banks.

However, despite the most popular claim that Islamic banks are true reflections of Islamic-compatible formulation that the clients themselves respect and believe in, previous empirical studies found that religious motivation is not the sole criterion for the selection of Islamic banking institutions or services. Given the amount of empirical research on this issue and the wide range of empirical results, mainly on individual countries, there appears to be no clear consensus among research on this issue. It is interesting to know whether religious dimension does play an important role in determining the savings behaviour of customers. From conventional and Islamic literature review, we cannot conclude any unified solution about the determinants of Islamic saving deposit in Islamic and conventional banks. We will make a humble attempt in the present project, take lead from these studies and examine the banks depositors' loyalty in growing region Southeast Asian countries. We attempt to contribute to this line of inquiry in several aspects. The project analyzes the determinants of bank deposit in a panel of five South-East Asian countries.

Methodologically, most of the previous research examine the determinants using univariate time series data of single country over a prolonged period of time. In light of this, the study extends this line of research to a sample of South East Asian countries on a country-by-country basis and to panel data modeling to examine the determinants of private saving,

The purpose of this project is to examine empirically the main determinants of banks deposit and to extend our understanding of the impact of these factors on deposit determination. Secondly, examining the factors have similar impact or not on both conventional and Islamic

#### The Methodology used

Cointegration techniques such as Johansen (1988), Johansen-Juselius (1990) and Pesaran and Pesaran (2001) ARDL approach are utilized in the economic literature to empirically determine the relationship among the variables. The ARDL model has some advantages over other cointegration approaches.

Firstly, this technique is comparatively more robust in small or finite samples consisting of 30 to 80 observations (Pattichis, 1999; Mah, 2000). Secondly, it can be utilized irrespective of whether regressors are of  $I(0)$  or  $I(1)$  or mutually integrated, There is still prerequisite that none of the explanatory variables is of  $I(2)$  or higher order, i.e. the ARDL procedure will, however, be inefficient in the existence of  $I(2)$  or higher order series. Thirdly, the ARDL Model applies general-to-specific modeling framework by taking sufficient number of lags to capture the data generating process. It estimates  $(p + 1)k$  number of regressions in order to obtain an optimal lag length for each variable, where  $p$  is the maximum lag to be used, and  $k$  is the number of variables in the equation. The model is selected on the basis of different criteria like SBC, AIC, RBC and HQC.

Furthermore, traditional cointegration methods may also experience the problems of endogeneity, whereas the ARDL method can distinguish between dependent and explanatory variables and eradicate the problems that may arise due to the presence of autocorrelation and endogeneity. ARDL cointegration estimates SR and LR relationship simultaneously and provide unbiased and efficient estimates. The appropriateness of utilizing ARDL model is that the ARDL model is based on a single equation framework. The ARDL model takes sufficient numbers of lags and direct the data generating process in a general to specific modeling framework (Harvey, 1981). Unlike further multivariate cointegration techniques such as Johansen and Juselius (1988), ARDL model permits the cointegration relationship to be estimated by OLS once the lag order of the model is identified. Error Correction Model (ECM) can also be drawn from by ARDL approach (Sezgin and Yildirim, 2003). This ECM allows drawing outcome for LR estimates while other traditional cointegration techniques do not provide such types of inferences. “ECM joins together SR adjustments with LR equilibrium without losing LR information” (Pesaran and Shin, 1999). The above advantages of the ARDL technique over other standard cointegration techniques justify the application of ARDL approach in the present study to analyze the relationship among TDP, GDP, INF AND KLC.

The second step in the analysis is to “test the null hypothesis of no cointegration against the alternative hypothesis that there exists cointegration between all variables by using F-statistic. This test is sensitive to the number of lags employed on each first differenced variable (Bahmani-Oskooee, 1999)”. In the next step, SR and LR linkage is examined by using the error correction model (ECM). The error correction equation is used to find the adjustment speed to the equilibrium in the third stage.



A simple model is used to examine the variations in Total savings deposit (TDP) in Islamic Banks of Malaysia. There are number of factors which influence the Islamic banks savings deposits in Malaysia.

The functional form of the model is as:

$$TDP = f(GDP, INF, KLCI)$$

Where

TDP = Total saving deposit of Islamic banks in Malaysia.

GDP = Gross domestic Product , Proxy (Industrial production)

KLCI = Kuala Lumpur Composite Index.

The ARDL approach to cointegration involves estimating the unrestricted error correction model version of the ARDL model for Islamic saving deposit and its determinants:

The error correction version of the model is as follows:

*LTDP, LKLC LGDP, INF*

$$dLTDP_t = a_0 \sum_{i=1}^8 b_i dLKLC_{t-i} + \sum_{i=1}^7 c_i dGDP_{t-i} + \sum_{i=1}^7 d_i dINF_{t-i} + \mu_t$$

$H_0 : \delta_1 = \delta_2 = \delta_3 = 0$       Non existence of the long - run relationship

$H_1 : \delta_1 \neq \delta_2 \neq \delta_3 \neq 0$       Existence of a long - run relationship

## Data, Empirical Results and Discussions

The data used here are the monthly in the period January 2007 to December 2013. The start date is dictated by the inception of the new format for Islamic banking data in BNM. A total

of 86 observations were obtained. The source of all these variables is Bank Negara Malaysia (BNM) monthly statistical bulletin.

As discussed earlier, we use the following variables for our lead-lag analysis. The variables taken were real Islamic banks savings deposit(TDP), Growth Domestic Product (GDP), Kuala Lumpur composite Index(KLC) and Inflation rate ( INF). All the variables (except the inflation rates) are transformed into logarithms to achieve stationarity in variance. All the ‘level’ forms of the variables were transformed into the logarithm scale but that was not necessary for the inflation rate variable, which was originally in percentage form.

We begin our empirical testing by determining the stationarity of the variables used. In order to proceed with the testing of cointegration later, ideally, our variables should be I(1), in that in their original level form, they are non-stationary and in their first differenced form, they are stationary. The differenced form for each variable used is created by taking the difference of their log forms. For example,

$$DTDP = LDP - LTDP_{t-1}.$$

We then conducted the Augmented Dickey-Fuller, Philip-Perron and KPSS test.

(ADF) test on each variable (in both level and differenced form). The table below summarizes the results.

Variable	Test Statistic	Critical Value	Implication
Variables in Level Form			
LTDP	-2.3953	-3.4673	Variable is non-stationary
LGDP	-2.3669	-3.4673	Variable is non-stationary
LKLC	-2.6031	-3.4673	Variable is non-stationary
INF	-5.3315	-3.4673	Variable is stationary
Variables in Differenced Form			

DTDP	-6.4337	-2.8991	Variable is stationary
DGDP	-9.3322(AIC) -16.2113(SBC)	-2.8991	Variable is stationary
DKLC	-7.2632	-2.8991	Variable is stationary
DINF	-10.5846 (AIC) -6.5659 (SBC)	-2.8991	Variable is stationary

#### PP TEST

Variable	Test Statistic	Critical Value	Implication
Variables in Level Form			
LTDP	-3.3754	-2.8239	Variable is stationary
LGDP	-5.8043	-3.5508	Variable is Stationary
LKLC	-9.3995	-3.4545	Variable is stationary
INF	-4.8355	-3.4545	Variable is stationary
Variables in Differenced Form			
DTDP	-9.3889	-2.9520	Variable is stationary
DGDP	-21.8334	-2.9520	Variable is stationary
DKLC	-7.4054	-2.9520	Variable is stationary
DINF		-2.9520	

KPSS test			
Variables in Level Form			
LTDP	.16065	.14345	Variable is stationary
LGDP	.12530	.14345	Variable is non stationary
LKLC	.10344	.14345	Variable is non-stationary
INF	.096069	.14345	Variable is non-stationary
Variables in Differenced Form			
DTDP	.37725	.38489	Variable is stationary
DGDP	.17786	.38489	Variable is stationary
DKLC	.11947	.38489	Variable is stationary
DINF	.11486	.38489	Variable is stationary

On the above mentioned results of unit root test we can see that it varies from one test to another test. The results are not consistent. Variables we are using for this analysis are  $I(0)$  or  $I(1)$ . As the results of unit root test are not consistent we decided to use ARDL technique to test the long run relationship among the variables.

Before proceeding with the test of cointegration, we try to determine the order of the vector auto regression (VAR), that is, the number of lags to be used. As per the table below, results show that AIC recommends order of three whereas SBC favours one lag

	Choice Criteria	
	AIC	SBC
Optimal order	3	1

There are conflicts between recommendation of AIC and SBC.

### Testing Cointegration

An evidence of cointegration implies that the relationship among the variables is not spurious, i.e. there is a theoretical relationship among the variables and that they are in equilibrium in the long run.

### Engle –Granger (E-G) Test

Engel Granger	
T statistics	Critical value
-2.7692	-4.2432

As depicted in the above table the critical value is higher than t statistics. So, we cannot reject the null that the residuals are non stationary. Statistically, the above results indicate that the variables we have chosen, in some combination, result in not a stationary error term . As Its non stationary that indicates that there's not any cointegration.

These initial results are not intuitively appealing, to our mind. So, we decided to go for Johansen cointegration test.

As depicted in the table below, the maximal Eigenvalue, Trace ,SBC and HQC indicate that there is two cointegrating vector whereas according to AIC there are 4 cointegrating vectors, respectively .

Criteria	Number of cointegrating vectors
Maximal Eigenvalue	2
Trace	2
AIC	4
SBC	2
HQC	2

The statistics refer to Johansen’s log-likelihood maximal eigen value and trace test statistics based on cointegration with unrestricted intercepts and restricted trends in the VAR. These results conflict each other , it also conflict with Engle – Granger. As these approaches have many limitations that are taken care by ARDL. For that we decided to go for ARDL approach for testing cointegration among variables.

Table: F-Statistics for Testing the Existence of Long-Run Relationship

Variables	F statistics	Critical Value Lower	Critical Value upper
LTDP	4.0467	2.850	4.049
LKLC	9.0029	2.850	4.049
LGDP	10.2516	2.850	4.049
INF	6.5598	2.850	4.049

The critical values are taken from Pesaran et al. (2001), unrestricted intercept and no trend with four regressors. \* denote rejecting the null at 5 percent level. The range of the critical value at 1 percent and 10 percent are 3.817-5.122 and 2.425-3.574 respectively.

Table shows the calculated F-statistics is higher than the upper bound critical value 4.049 at the 5% significance level. This implies that the null hypothesis of no cointegrating long-run relationship can be rejected. These results reveal that a long-run relationship exists between the macroeconomic variables and Islamic banks saving deposit in Malaysia. This by itself is a significant finding in view of the fact that the long run relationship between the variables is demonstrated here avoiding the pre-test biases involved in the unit root tests and cointegration tests required in the standard cointegration procedure. The evidence of long run relationship rules out the possibility of any spurious relationship existing between the variables. In other words, there is a theoretical relationship existing between the variables.

Next, the ECM's representation for the ARDL model is selected AIC Criterion. Table provides the estimates of the ARDL long-run coefficient for the model. The estimated long run coefficients of the long run relationship above show that GDP, Kualalumpur composite Index and Inflation have significant effects on the total saving deposit of Islamic banks in Malaysia.

### Results of Error Correction Models

Variables	Coefficient	Standard Error	P-Value
ecm (-1) dLTDP	-.22445	0.010342	0.035*
ecm (-1) dLGDP	-0.56017	0.10785	0*
ecm (-1) dLKLC	-0.022818	0.061778	0.713
ecm (-1) dINF	-.81591	0.16166	0*

Note: \* denotes significant at 5 percent level

As stated earlier, cointegration tells us that there is a long run relationship between the variables. However, there could be a short-run deviation from the long-run equilibrium. Cointegration does not unfold the process of short-run adjustment to bring about the long-run equilibrium. For understanding that adjustment process we need to go to the error-correction

model . The ‘t’ ratio or the ‘p’ value of the error-correction coefficient indicates whether the deviation from equilibrium (represented by the error-correction term) has a significant feedback effect or not on the dependent variable (i.e. credit ratings). In other words, whether the dependent variable is endogenous or exogenous. The error-correction coefficient being significant confirms our earlier findings of a significant long-run cointegrating relationship between the variables. Moreover, the size of the coefficient of the error-correction term indicates the speed of short-run adjustment of the dependent variable to bring about the long-run equilibrium. The size of the coefficient of the error-correction term is also indicative of the intensity of the arbitrage activity to bring about the long-run equilibrium. The error correction coefficient estimated at -0.22245 (0.035) is highly significant, has the correct sign and implies a moderate speed of adjustment to equilibrium after a shock. Finally, the ‘t’ or ‘p’ value of the coefficients of the  $\Delta$ (i.e., differenced) variables indicate whether the effects of these variables on the dependent variable (i.e., credit ratings) are significant or not in the short-run. We find that the GDP and Inflation have significant effects on the Islamic saving deposit.

#### Variance Decompositions (VDC)

Although the error correction model tends to indicate the endogeneity/exogeneity of a variable, we had to apply the variance decomposition technique to discern the relative degree of endogeneity or exogeneity of the variables. The relative exogeneity or endogeneity of a variable can be determined by the proportion of the variance explained by its own past. The variable that is explained mostly by its own shocks (and not by others) is deemed to be the most exogenous of all. We started out applying orthogonalized VDCs and obtained the following results.

	Horizon	DTDP	DKLC	DINF	DGDP
DTDP	24	71.20%	9.14%	12.11%	7.54%



DKLC	24	8.42%	64.06%	19.88%	7.64%
DINF	24	13.19%	10.28%	72.02%	4.51%
DGDP	24	10.08%	17.71%	7.98%	64.24%

	Horizon	DTDP	DKLC	DINF	DGDP
DTDP	36	71.09%	9.14%	12.23%	7.54%
DKLC	36	8.49%	63.88%	20.00%	7.63%
DINF	36	13.21%	10.28%	71.99%	4.52%
DGDP	36	10.14%	17.68%	8.03%	64.15%

In our table, at the end of the forecast horizon 24 months, the contributions of own shocks towards explaining the forecast error variance of each variable are as follows: Islamic deposits variable (98.18%), rate of return variable (6.68%) and interest rate variable (98.18%).

The variable that is explained mostly by its own shocks and depends relatively less on other variables is the leading variable. These results tend to indicate that the Islamic banks savings deposit variable is the most exogenous of all and also, it explains 9.14% of the variance of KLCI and 12.23% of the Inflation. whereas the KLCI variable explains only 8.49% of the variance of total Islamic saving deposit but it explains 63.88% of KLC. GDP explains only 10.15% of the variance of Islamic Bank saving deposit and 17.68% of variance of KLC, 8.03% of the variance of Inflation and 64.15% of the variance of GDP.

There are two important limitations of orthogonalized VDCs. Firstly it depend on the particular ordering of the variables in the VAR, Secondly it assumes that when a particular variable is shocked, all other variables in the system are switched off. Generalized VDCs do not have these limitations so we decided to rely on it. We applied Generalized VDCs and obtained the following results.

DTDP	12	71.00%	8.96%	11.99%	8.05%
DKLC	12	7.83%	65.80%	18.57%	7.81%
DINF	12	12.04%	10.21%	72.98%	4.77%
DGDP	12	9.66%	18.38%	6.32%	65.64%

	Horizon	DTDP	DKLC	DINF	DGDP
DTDP	24	69.46%	8.91%	13.41%	8.22%
DKLC	24	8.48%	64.58%	19.15%	7.79%
DINF	24	13.26%	10.19%	71.60%	4.95%
DGDP	24	10.20%	18.28%	7.05%	64.48%

In our table, at the end of the forecast horizon 24 months, the contributions of own shocks towards explaining the forecast error variance of each variable are as follows: Islamic saving deposits variable (69.46%), KLCI (64.68%) , Inflation (71.60%) and GDP ( 64.48%).

These out-of-sample variance forecast results given by the generalized variance decompositions further strengthen our earlier within-sample results given by the error correction model that the total deposit (rather than lags) both Islamic rate of return and conventional interest rate .

This result is different from orthogonalized result. Here we can see that , Inflation is the most exogenous variable and the variance of Inflation mostly explained by its own past. Total deposit mostly affected by Inflation but GDP and KLCI is endogenous relative to the Inflation and Islamic savings deposit.

With regards to the KLCI, which indicates growth and portfolio selection of customers, does not have a significant impact on the saving deposit of Islamic bank. A plausible justification

for this is because Muslims believe that activities in stock market involve gambling and speculation, which are prohibited in Islam.

Theory postulates that higher inflation increases savings. Our finding reveals that this theory is only applicable to for conventional banks customers only. We find a strong effect of Inflation on Islamic banking savings deposit. There is an inverse relationship between Inflation and Islamic Banks saving deposits. The result indicates that Islamic bank saving facilities are reduced when there is an increase in CPI.

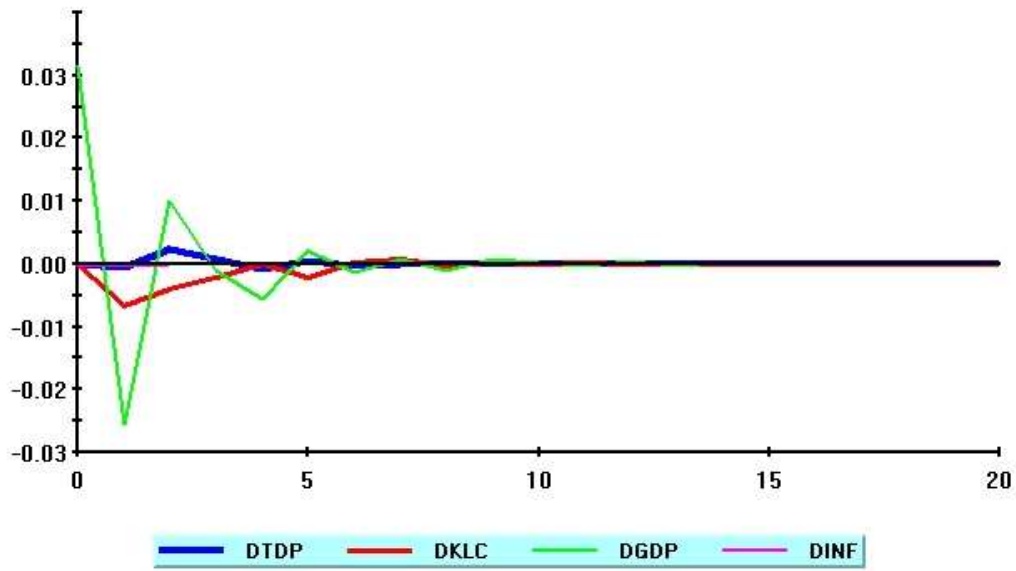
GDP Previous study and theory has ambiguous different result about the effect of GDP on bank deposits. Theory postulates that higher growth (GDP) led to lower savings because of anticipated higher future income. This finding lends support for the permanent-income hypothesis. In contrast, Previous study shows that customers of Islamic bank tend to save more at the time of higher GDP. Our result indicates that GDP does not have significant impact on The Islamic banks savings deposits. A possible justification is that increase in industrial production does not affect the depositors' savings or withdrawal decision in Islamic banks in short run. A big number of customers of Islamic banks deposit their money to Islamic banks not for profit but for safekeeping, so they are not worried about Industrial production increase as it does not affect their saving surplus.

## IMPULSE RESPONSE ANALYSES RESULT

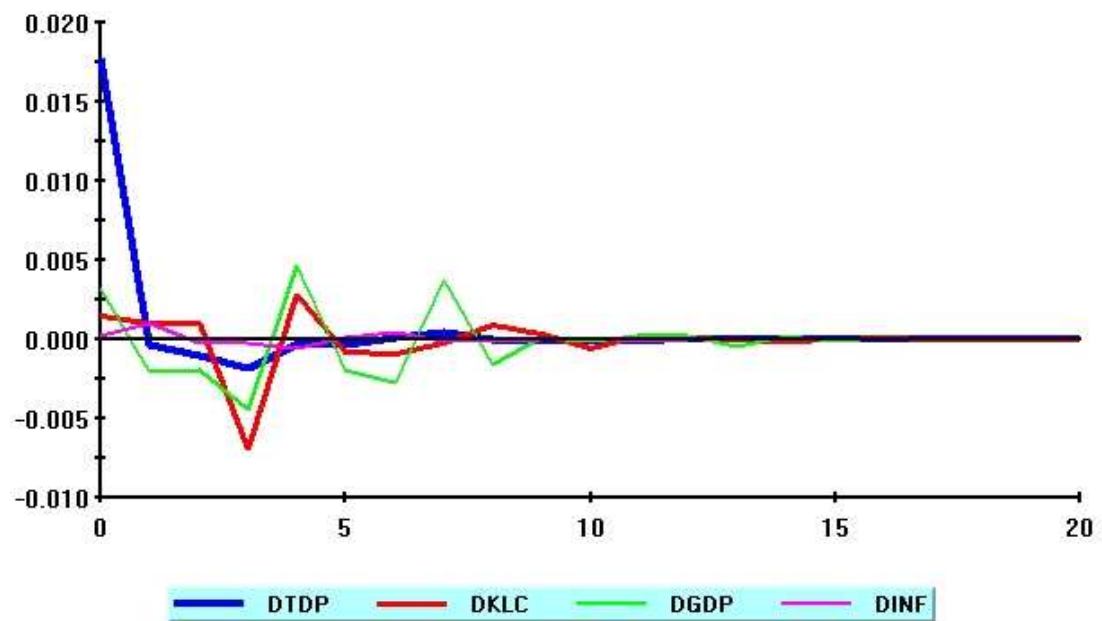
The impulse response functions (IRFs) essentially produce the same information as the VDCs, except that they can be presented in graphical form. We started out applying orthogonalized IRF and obtained the following results.

Variable

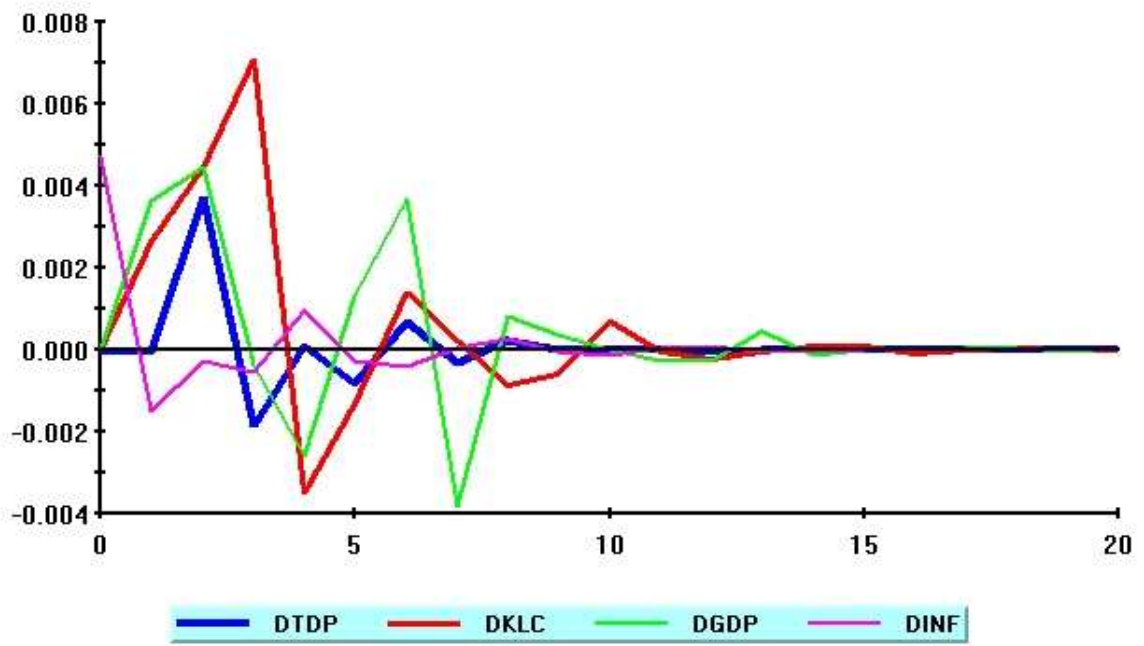
DDP



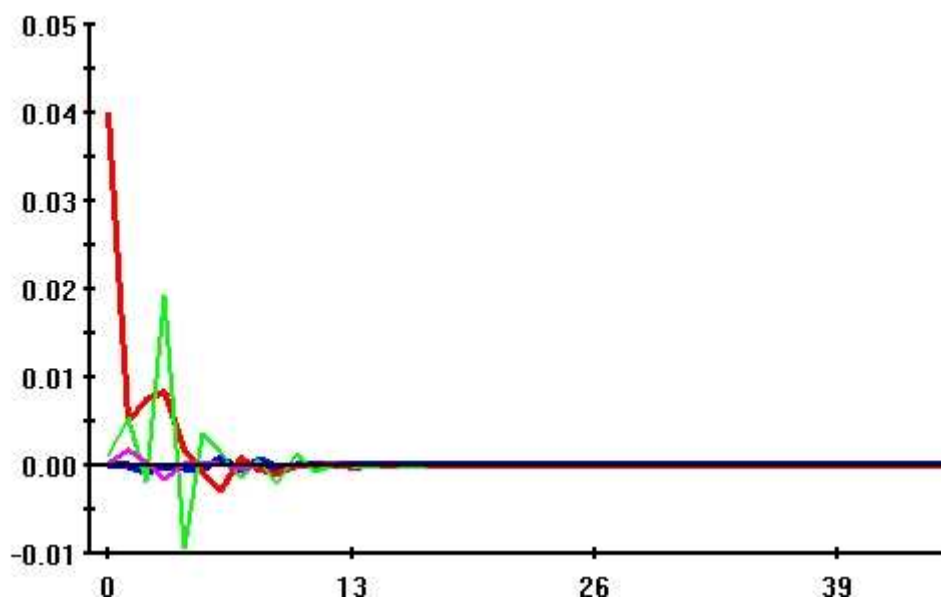
DTDP



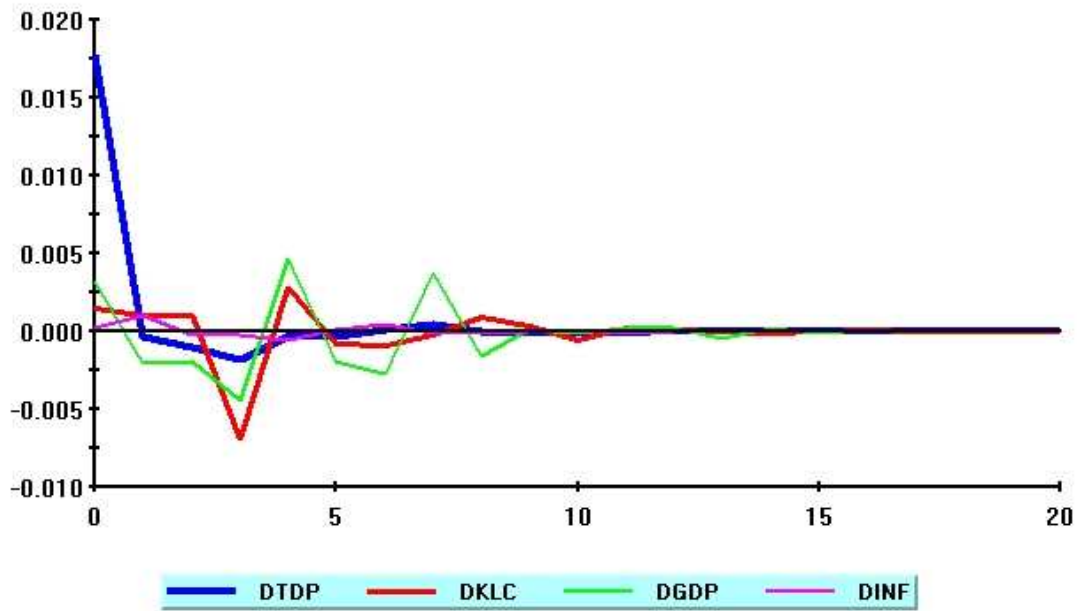
Variable INF



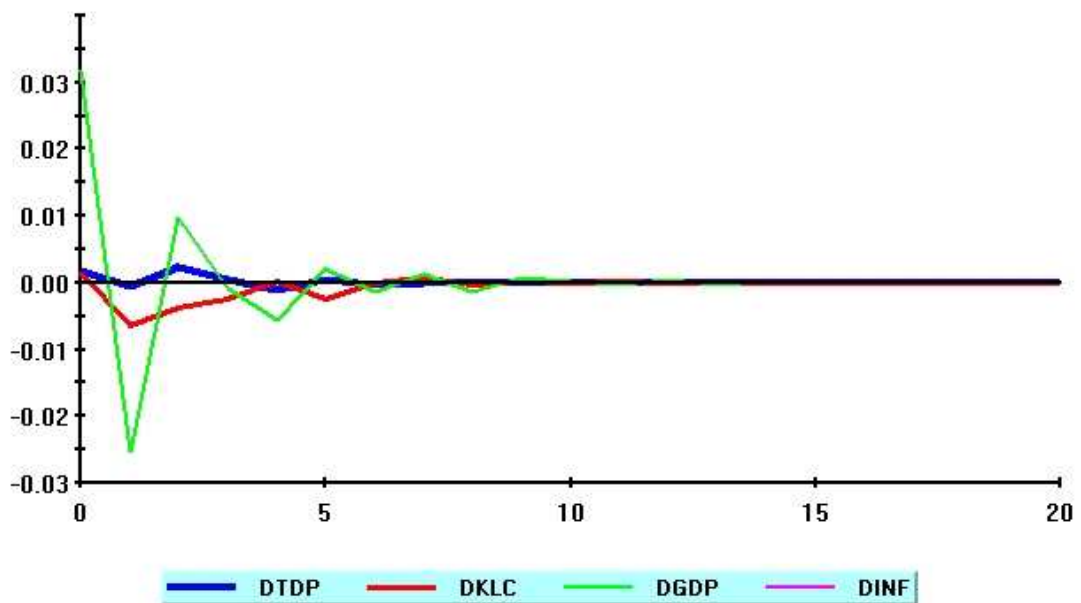
Variable DKLC



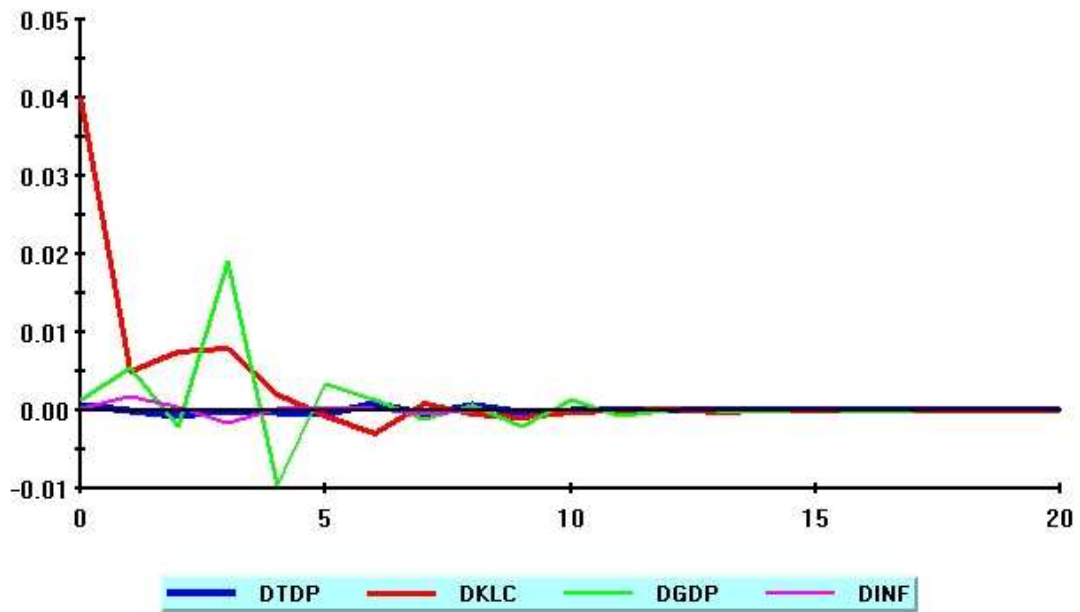
Variable DTDP



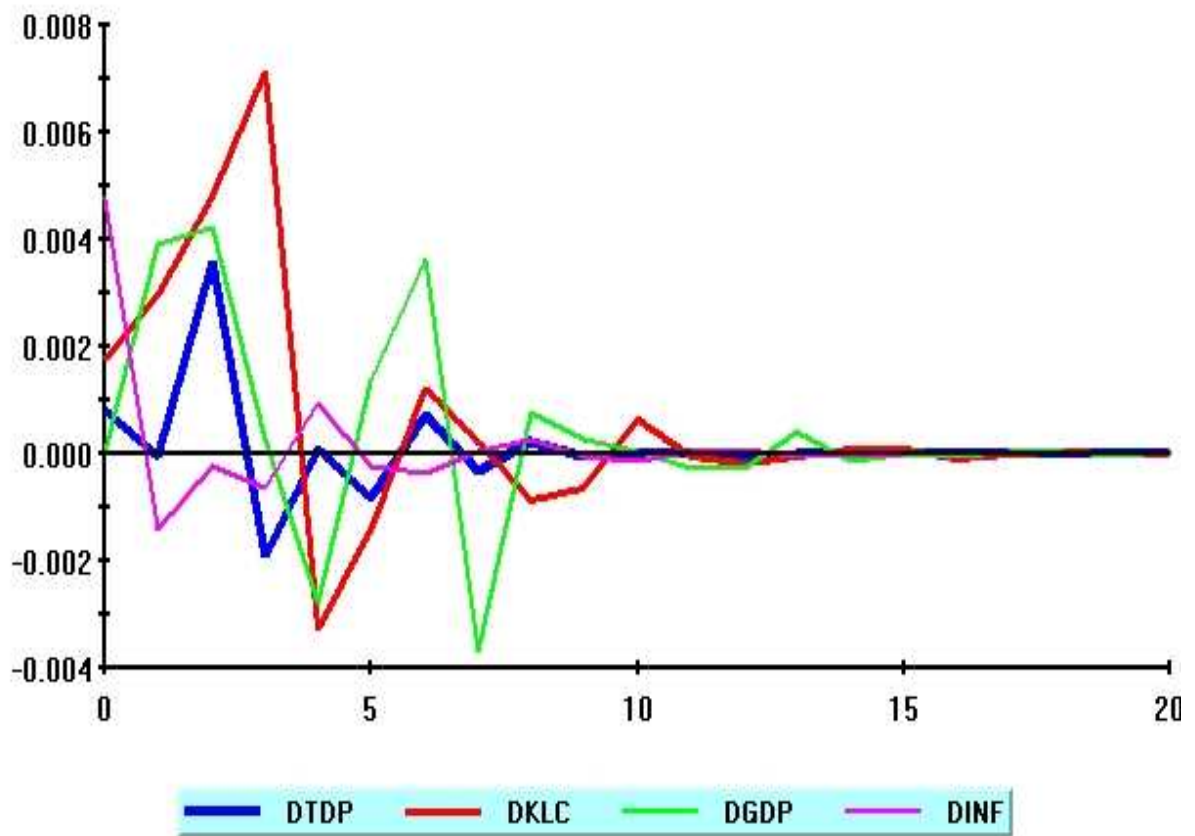
Variable DGDP



Variable DKLC



DINF



Figures present the orthogonalised and generalised responses of dependent variables to shocks on their independent variables. It can be seen in Figure that savings account of Islamic bank responds immediately to a shock in Inflation . The responses are not that much significant on Total saving deposit when shocks are introduced in KLCI, and GDP. However, Inflation responded negatively to a shock from TDP. Overall, the responses are small and tend to start to dampen after ten months before dying out in six or seven months. Similarly, the response of savings deposit of Islamic bank to a 1 per cent shock in the TDP of its' explanatory variables are small and dampens out in month 10. All responses die out after month 6. With respect to savings account in Islamic bank, shows that this dependent variable responded immediately but in a small magnitude to a shock in Inflation.

#### Concluding Remarks and Policy Implications

There are two broad types of learning we have from the exercise carried out in the present study: (i) methodological and (ii) related to development of Islamic banks arising from the experience of the Malaysian Islamic banking industry. Most papers in the literature so far have analyzed the macroeconomic variables and savings separately. Few attempts have been made to analyze these variables in a simultaneous equation framework. The simultaneous effect of inflation on both economic growth and savings has also not been examined so far in a comprehensive framework. On the other hand, there are not only solid theoretical reasons to believe that these variables are determined simultaneously, but also that savings and inflation are very instrumental in the growth of Islamic banking Industry. The most relevant finding of the present paper from the methodology angle is that growth and saving rate has bidirectional simultaneous relationship. Although we found only unidirectional relationship between inflation and growth in our sample. Similarly, Kuala Lumpur composite Index was not found to affect the saving rate in our sample, but it needs to be considered while examining the interrelationships among growth, savings and inflation. The present study attempted to address this methodological issue and thereby the methodological limitations of earlier studies on the subject. The widely varying macroeconomic factors affecting Islamic bank saving deposits provided an interesting ground to analyze these relationships.



The most relevant finding from the policy perspective is the significant negative effect of inflation on the Islamic banks saving deposits. Thus, controlling inflation and thereby providing macroeconomic stability is essential for promoting Islamic banking. In the present situation of unprecedented rise in global commodity prices, the concern of the policy makers to control inflation is paramount. All developing countries targeting a high growth rate are grappling with this problem. Our findings from the data on Malaysian Islamic Banking Industry reject the popular hypotheses that Banks' saving deposits increase as a result of an increase in inflation. Thus, there exists a clear trade-off between Islamic bank savings deposit and inflation in following any monetary policy and the policy makers must exercise the choice cautiously.

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